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Abstract

This paper analyses tax harmonisation in the SADC region. Results of first attempt to devise a tax policy harmonisation measure (TPHM) by the use of a cross-sectional and panel data are reported. New methodology of computing optimum tax rates (OTRs) are introduced and a robustness test (via a sensitivity analysis) on the impact of taxation (based on new tax dataset from the TPHM and OTRs computation) on FDI inflows to the SADC is conducted.The research shows a need for the SADC countries to develop policies aimed at collectively expanding their corporate tax base in order to accommodate the relatively low optimum CIT rates. It is also shown that the adoption of an optimum VAT rate by all SADC member countries will reduce the usage of different politically motivated VAT rates by individual member states as instruments to gain voters' confidence. The research shows that, some further policy considerations towards enhanced harmonisation and tax revenue could include developing a benchmarking process with other regional economic groupings such as the EU and the EAC.

Keywords: SADC; Harmonisation; Tax Policy; Tax Rates; EBA; FDI.

1 Introduction

The regional indicative strategic development plan (RISDP) of the Southern African Development Community[1] (SADC) cites 2018 as the final step in the timeframe of transitioning the region from a free trade area (FTA) (achieved in 2008) to an Economic and Monetary Union (EMU), with harmonisation of a

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[1]The SADC consists of Angola, Botswana, DR Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe. For more exposition, see SADC (2011).

range of policies within the economic and political domain (SADC, 2006; SADC, 2012) and a regional central bank.

However, as outlined in several studies[2], all the SADC countries did not meet the initial convergence criteria (set as precondition) towards an economic integration in 2008 and also did not attain the timelines of transition towards an EMU. Progress was delayed (or even reversed in some countries) as a result of the global economic crisis commencing from 2007 (SADC, 2012). As the SADC member countries still have not met the macro-economic convergence criteria at the time of writing in 2016, a new timeframe for continued convergence towards an EMU has to be set. Once an EMU is introduced, member states will have a common currency and harmonise a range of policies, including fiscal policy and taxation (Ade, 2008; Johns, 2009). Accordingly the SADC members focus growing attention on policy areas (including tax policy) with the aim of standardising or improving policy co-operation, reducing possible discriminatory effects and mitigating the consequences of tax competition, albeit within the structure of existing regional protocols[3].

Previous studies (see for example Glenday, 2004; Letete, 2011 and 2012) on taxation in the SADC have largely been theoretical and have principally focused on the possibility of harmonising indirect taxes (mainly value added tax or VAT). Our paper builds on previous tax studies by introducing VAT harmonisation in an empirical analysis and by including the prospects of harmonising corporate income taxes (CIT)[4]. The choice of VAT amongst other indirect taxes is due to the importance of VAT, which is one of the main sources of indirect tax revenue for most countries in the region and also because of the lack of empirical studies using VAT as an FDI determinant (PWC, 2011). This study also complements Gupta (2007) and Garikai (2009), who investigated the determinants of tax revenue efforts in Sub-Saharan Africa (SSA) and tax buoyancy in the SADC, respectively.

The objectives of this paper are to: analyse the extent of tax harmonisation (various tax regimes, tax rates, tax policy regulations) and co-movement for all the 15 SADC countries; evaluate as well as measure the extent of tax policy harmonisation (TPH); compute optimum tax rates (OTRs); and conduct a robustness test (via a sensitivity analysis) on the impact of taxation (based on new tax dataset from the *TPH* measure and OTRs computation) on FDI inflows to the SADC. Moreover, it reports the findings of a first attempt to systematically devise a *TPH* measure by the use of a cross-sectional and panel data; and

[2] See for instance Rossouw (2006) and Johns (2009) in this regard.

[3] For a detailed discussion of these regional protocols (set of rules, guidelines and principles) namely, the MOU in taxation and other related matters ratified in 2002 and the 2006 finance and investment protocol (FIP), see SADC (2002; 2006).

[4] Regional tax harmonisation initiatives can assume any range from Standardisation, Compatibility, Coordination, Co-operation to Convergence (Velayos et al., 2008). This study proposes tax rates harmonisation through a process whereby member countries can first gradually reduce the current tax band or the range of tax rates (both CIT and VAT), converge at an acceptable robust range of rates, before aiming for a uniform harmonisation. In harmonising SADC regional tax policies, systems and laws, the study proposes enhanced co-operation in tax-related matters as outlined in the 2002 MOU on taxation.

introduces new methods of computing OTRs (on cross-sectional data for 2010 only). The paper also sets the basis for a subsequent investigation (involving both panel and dynamic panel models and accounting for country specificity) of the effect of tax harmonisation in the SADC on FDI inflows. This is more so, given that increased divergence or less harmonisation (more variation) in tax policy in any economic regional grouping will eventually affect investment (including FDI) at both the micro and macro levels, which would warrant the need for some sort of co-ordination (Sudsawasd and Mongsawad, 2011).

The remainder of the paper is organised as follows: Section 2 reviews existing literature, Section 3 provides an overview of the SADC regional characteristics and national tax systems. Section 4 highlights the extent of tax harmonisation in the SADC. Section 5 discusses the data, tax measures and techniques (including TPHM and OTRs results). Section 6 presents the EBA methodology and robustness results. Section 7 concludes and highlights policy implications.

2 Literature review on tax harmonisation

Barna and Mura (2010) noted that there are different corporate tax rates among European Union (EU) states, creating significant disharmony and imbalances between specific companies within the union. The EU reacted to the problem with a proposition to introduce the Common Consolidated Corporate Tax Bases (CCCTB) The CCCTB enables multinational companies to determine their consolidated European profits on the basis of uniform rules and the tax base would be allocated to the member states according to some allocation formula. Each member state would then be allowed to apply its national tax rate to its part of the tax base. The approach will reduce the burden of tax compliance without requiring that member states adopt a uniform (or minimum corporate) tax rate, enhance the harmonisation of corporate taxes in the EU and improve FDI between EU countries.

Genser (2003) surveyed coordination and harmonisation requirements for a final European viable integrated VAT (VIVAT) system. Under the VIVAT system the VAT chain would be preserved by imposing an EU-wide uniform rate on all cross-border transactions between registered traders. Export would be taxed and importers would be entitled to a tax credit for out of state purchases. A member state's preference for a higher VAT rate than the common rate would be satisfied by permitting it to differentiate its rate for sales at retail (Genser, 2003:749-750). Adoption of a VIVAT system will encourage both inter- and intra-regional flow of trade and FDI. A drawback of VIVAT would be that the supplementary retail sales tax would increase collection and compliance costs.

Petersen (ed) (2010) provide a detailed overview of the basics of the EAC integration and tax harmonisation process. The author review the national tax systems of member countries before exploring the possibility and benefits that will accrue from members having single tax bases and tax rates. The review is aligned to Doe (2006) who highlighted the importance of harmonising domestic consumption taxes in Central and Western African countries towards improved

revenue positions for countries in the regions.

Robinson (2004) notes that marginal income tax rates in the SADC are already high in comparison with international standards and increases in these rates are likely to distort employment, savings and investment even more, with a likely increase in tax evasion. In terms of commodity tax coordination, the author also observes that member states would either have to broaden jointly the tax base or jointly increase tax rates to compensate for losses incurred by the planned free trade area (FTA) and/or customs union, which involve members setting a common external tariff to nonmembers. The study concludes by recommending that a structured approach to tax harmonisation policy - which includes adopting permissible tax rate "bands" for VAT or setting of minimum regional VAT rates - within the SADC region be adopted.

Glenday (2004) opines that when groups of neighbouring countries establish a Free Trade Area (FTA) as is envisaged for the SADC region under the Trade Protocol; border controls on VAT may get weakened or removed. He recommends a staged approach to develop a regional consumption tax structure over the medium term. The structure could then be rolled out to all the SADC member states with VAT systems meeting the required degree of harmonisation, such that internal exports (exports between member states in a regional FTA) are subject to tax at either the domestic rate or a compensating VAT (CVAT) rate by the time the SADC common market is in place. Under the CVAT scheme interstate sales to registered traders would be zero-rated by the state of origin and subject to deferred payment of VAT by registered businesses in the state of destination. Registered traders would be allowed to claim credits for the compensating VAT (Glenday, 2004)[5].

Cnossen (2011) explored the level and scope of coordination of indirect taxes, including VAT, within the SADC, drawing lessons from the EU and made very important recommendations. First he advocates that as in the EU, VAT rates should be agreed upon at an SADC forum for VAT A further recommendation is for the abolition of import duties which can be replaced by regional VAT rates and excise duties taking over the revenue role of import duties. Such an action would enhance the physical and free movement of products within the SADC (Cnossen, 2011).

Letete (2011) examines the extent to which harmonisation of VAT rates, laws and policies can be achieved in the SADC region. The study states that, in order to broaden the VAT base and aim for higher revenues and investment, it is necessary that member states harmonise policies and rates, and agree on items to be zero rated, reduced or exempted. Letete (2012) subsequently highlighted that the harmonisation process is vital in so far as it aims at ensuring that equal conditions for competitors are not distorted by discriminatory tax systems. This would also mitigate the demerits of tax competition in the SADC.

This literature review shows the need for more research on tax harmonisation in the SADC region; the topic addressed in this paper.

[5]Both the CVAT and the VIVAT are two imaginative, high profile proposals for forms of VAT which are still under consideration (Cnossen, 2011).

3 Overview of SADC regional characteristics and national tax systems

The SADC region is predominantly characterised by low levels of domestic resource mobilisation (DRM), largely diverse economic structure (with most countries endowed with a variety of natural resources), large informal sector and underground economies (which is largely tax non-compliant), large agricultural sectors, low productivity and poor transport and infrastructure (UNCTAD, 2007; ATAF, 2012)[6].

All partner states in the SADC region operate modern tax systems, comprising both direct and indirect taxes. The main component of direct taxes are income and profits taxes (on labour and capital income), often accompanied by property taxes. The main components of indirect taxes are VAT[7], which is a general consumption tax, excise taxes and particular taxes levied on specific goods to raise government revenue, although there are some differences between the tax systems of member countries. All the SADC countries (except Angola) have VAT systems, all except the Seychelles have payroll taxes and all have corporate taxes on profits. However, the definitions of the tax bases are extremely heterogeneous (see for instance PWC, 2011, SADC, 2012 and Deloitte and Touché, 2013).

Enhanced co-operation in tax matters occurs in the SADC in the form of mutual and multilateral assistance in tax matters (MATM), tax treaties and double tax agreements (DTAs) (Deloitte and Touché 2013). There is potential for more co-operation in tax policy in the SADC and in respect of other African regions, given the existence of a fair degree of co-movement and harmonisation in both corporate income tax (CIT) and value added tax (VAT) rates. The graphs below highlight the co-movement for 2010 in the SADC and East African Community (EAC), showing that CIT and VAT trend positively.

Owing to initiatives of African and partner organisations like the African Tax Administration Forum (ATAF) and the International Monetary Fund (IMF)[8], there has been increased co-operation in tax matters between SADC and other regional groupings in Africa, including the East African Community (EAC) as is explained below.

Figures 1 and 2 above juxtapose both the CIT and VAT rates in the SADC and the EAC regions. There is more harmonisation in the tax rates (both CIT

[6] See the World Bank (2013) and *African Economic Outlook* (AEO) (2014) for further exposition on SADC regional characteristics and selected indicators, including the ease of paying taxes, real gross domestic product, growth and public finance indicators.

[7] VAT was introduced by the SADC countries in the following years: Botswana (July 2002), DRC (January, 2012), Lesotho (July, 2003), Madagascar (September, 1994), Malawi (May, 1989), Mauritius (September, 1998), Mozambique (June, 1999), Namibia (November, 2000), Seychelles (January, 2013), South Africa (September, 1991), Swaziland (April, 2012), Tanzania (July, 1998), Zambia (July, 1995), Zimbabwe (January, 2004). Angola has no VAT (still under consideration) but has a reduced sales tax rate of 2% for essential foods and medical supplies, and higher rates of 20% and 30% for luxury products.

[8] Reference is made here to the functions of ATAF and the IMF's Africa Technical Assistance Center South (AFRITAC SOUTH) program (ATAF, 2012).

and VAT rates) of the EAC (comprising smaller number of countries) than that of the SADC. The SADC region is making progress in the VAT domain, given that it is a larger and more heterogeneous regional grouping (Petersen (Ed.) 2010; Letete, 2012). Recently, three of its members, namely DR Congo (January 2012), Swaziland (April 2012) and the Seychelles (January 2013) adopted VAT systems, while Tanzania reduced its VAT rate in line with other EAC members, also gravitating towards the SADC average (PWC, 2011; Deloitte and Touché, 2013). However, the overlapping membership of Tanzania of the SADC and EAC regions poses a potential conflict of interest and could stifle further initiatives aimed at increasing the level of tax harmonisation in SADC[9].

4 Extent of tax harmonisation in the SADC

This section provides further insight to the SADC regional tax policy by highlighting the trends and spread of both CIT and VAT in the SADC[10] and selected regions of the world[11]. The trends also form an integral part of the average tax rates in Africa, thereby enabling a comparison with other regions globally as is illustrated by Figures 3 and 4 below.

Given the comparatively high tax rates, there is need for Africa to reduce CIT rates and the total tax rates (tax cost as a percentage of profit) borne by multinationals in order to be more competitive in attracting foreign direct investment (FDI) (PWC, 2011)[12]. In addition, the relatively high VAT rate underlines the need for African countries to consider a more internationally competitive VAT rate.

5 Data, tax measures and techniques (including results discussion)

The main set of data used for this study (for the period 2000-2010) is compiled from three major sources, namely: the World Bank, UNCTAD and SADC online databases (see Table B.1 of Appendix B).

[9] In addition to Tanzania belonging to the EAC, all the other SADC countries (except for Mozambique) are also members of other regional groupings such as the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), the Economic Community of Central African States (ECCAS) and the Southern African Customs Union (SACU). This heterogeneity and overlapping membership could impact on potential harmonisation initiatives for the region. For further discussion, see Kritzinger Van-Niekerk (2005).

[10] See SADC (2011), Deloitte and Touché (2013) and KPMG (2014) for explicit discussion of SADC trends in average CIT and VAT rates

[11] The comparison is only done for the period 2006-2010 due to dearth of tax data.

[12] Even though North America has relatively high CIT rates than Africa, it generally attracts higher volume of FDI inflows (UNCTAD, 2011). This is perhaps due to higher but similar tax rates and non-tax related drivers such as better return on investment, infrastructure, market size and agglomeration economies (Fuest and Fuest, 2004).

5.1 Tax Policy Harmonisation Measure (TPHM) and results

This study calculates the TPHM[13] in the SADC using the equation of Sudsawasd and Mongsawad (2011:665), with specification as follows:

$$TPH_{i,t} = \frac{\mid \tau_{i,t} - \bar{\tau}_t \mid}{\bar{\tau}_t} x100 \quad (1)$$

Where TPH_{it} is the tax policy harmonisation index for country i at time t, $\tau_{i,t}$ is the tax rate for country i at time t, $\bar{\tau}$ is the group average and t is the time.

The computed trend in both VAT and CIT rates for the SADC using the mean-based *TPH* measure is presented in Appendix C (see Tables C.1 and C.2 respectively). A high *TPH* measure indicates a low level of harmonisation of tax policy because the percentage deviation of a country from a group's average tax rate is large. In contrast, a low *TPH* measure indicates a high level of harmonisation of tax policy because the percentage deviation of a country from a group's average tax rate is small (Sudsawasd and Mongsawad, 2011:667).

The extent of *TPH* is explained in Table C.3 of Appendix C which captures the variability in both VAT and CIT tax rates in the SADC. The relatively high tax policy harmonisation in VAT and the generally high (CIT) tax policy harmonisation levels are explained by the neighbourhood effect as countries tend to mimick tax policies thereby having similar tax rates (Letete, 2012; Mbakile-Moloi, 2006). Countries in the region are also restrained by domestic and political pressures compelling them not to administer invariably different tax rates (Sudsawasd and Mongsawad, 2011).

Considering that mean averages are very sensitive to extreme values and outliers producing spurious or inaccurate results, a consistency check is performed by calculating a median-based *TPH measure* which is resistant to outliers. The results of the median-based *TPH measure* improves on the mean-based *TPH measure*, specifically showing comparatively improved levels of VAT policy harmonisation compared to CIT policy harmonisation in all SADC countries. Additionally, the paper complements the mean-based *TPH measure* by computing competitive OTRs using available cross-sectional data for 2010 only.

5.2 Optimum tax rates computation and results

This study calculates OTRs (on both CIT and VAT[14] rates) for the SADC (considered as signalling mechanisms designed by countries to compete for FDI)

[13] The study uses various tax rates and tax policy as a reflection of tax competition in the SADC. A variation in tax rates and tax policy is indicative of increased tax competition as countries seek to create conducive conditions for FDI; while improved harmonisation in tax rates and policies is indicative of reduced tax competition. On this basis and in order to avoid duplication, there is no separate tax competition variable used in this study.

[14] VAT is a consumption tax paid for by the end user, as the deduction mechanism ensures that the VAT paid by businesses along the value chain does not bear on them. However, the potential liability for VAT registration, the basic structure of VAT or the design (often for non-tax policy objectives), can influence investment decisions in countries of regional blocs. Foreign investors have to gather accurate information regarding the (VAT) tax rates, tax credit, tax

structured along Mesa and Parra-Pena (2008)[15] According to Mesa and Parra-Pena (2008:16), ceteris paribus, a reduction (increase) in the tax rate will lead to an increase (decrease) in FDI and profits. Based on the set of relevant data, variables and appropriate proxies as outlined in Table B.2 of Appendix B, the OTRs are calculated following the specification as below:

$$OTR = \tau_i^* = 1 - \frac{3(\bar{\pi}_i + F_i^f)(a\ _i^f)^2}{(P - a\ _i^f)^3} \tag{E1.2}$$

Where τ_i^* is the tax rate on profits or sales revenue in country i, $\bar{\pi}$ is the profits or sales revenue in country i, F^f is transnational enterprise investments in country i, $a\ _i^f$ is the marginal cost of transnational enterprise in country i, P is the price and $(P - a\ _i^f)$is the subsidiary mark-up or the transnational enterprise company mark-up.

The results of the computed OTR indicator (τ_i^*) for a cross-sectional data are obtained and juxtaposed with the status quo regarding tax rates in the SADC, observing large similarity between the computed optimum tax rates (CIT or t1, VAT or t2) and current tax rates (CIT and VAT). This is captured in Table C.4 of Appendix C which provides a holistic view of both sets of taxes (existing tax rates and optimum taxes) and net FDI inflows per country in percentages for 2010. The average optimum CIT rate for all SADC countries is 29.53% while the existing average CIT is 30.37%. The average computed optimum VAT rate is 25.40% while the existing average VAT is 14.97%. The low existing VAT rates provide a better opportunity to increase VAT rates to the optimum levels, as opposed to the already high existing CIT rates, which do not allow much room to increase rates to the optimum levels (Deloitte and Touché, 2013) Jointly adopting optimum VAT rates instead of using different politically motivated current VAT rates by individual member states could act a signalling mechanism for improved FDI inflows to the SADC region

In terms of a vertical analysis (per tax type) (see Table C.4 of Appendix C), the optimum CIT rates reveal a smaller range (min 19% - max 41%) as opposed to a wider range and divergence in existing CIT rates (min 15% - max 40%). Alternatively, the optimum VAT rates reveal a wider range and divergence (min 17% - max 31%) as opposed to a smaller range in existing VAT rates (min 10% - max 20%) Despite the existence of a tax protocol there is still divergence in existing corporate tax regimes and tax policy amongst member states. For example Angola still does not have VAT[16] while Mauritius (considered a tax haven) has the lowest CIT rate of 15% and grants excessive tax incentives (PWC, 2011; SADC, 2012). The need exists for a tax policy shift

structure and exemption rules before deciding on an investment destination. These can have a significant impact on FDI inflows to regional groupings, especially if there are huge variations (PWC, 2011). Also, different VAT rates can perpetuate VAT fraud, including VAT carousel, thereby ultimately influencing investment (or location) decisions (Itriago, 2011).

[15] Also see Wet, Schoeman and Kock (2005) for a further discussion on OTRs in regional groupings.

[16] The General Sales Tax (GST) rate is used as a proxy

in SADC, in improving on regional tax co-ordination and tax policy stabilisation efforts.

In analysing the existing and optimum tax rates of SADC states across category (CIT vis-a-vis VAT), a huge gap between the average of the existing CIT rate (30.37%) and that of the existing VAT (14.97%) is observed; while there is a small difference in the gap between the optimum CIT average (29.53%) and optimum VAT average (25.40%). The low existing VAT rates might reflect the current disposition of governments in the SADC to ensure minimal VAT rates (as it is regressive), but present an opportunity for policy makers to increase VAT revenue through higher rates while also ensuring sufficient tax base. The higher optimum CIT rate, in comparison with the optimum VAT rate, further presents an opportunity for SADC policy makers to consolidate regional CIT revenue. This can for instance be achieved by introducing unitary taxation and mitigating corporate tax evasion and avoidance by multinationals.

The calculated OTRs (and the TPHM) are further used in a descriptive statistics analysis and correlation matrix highlighting the level of co-movement between the computed tax variables and FDI. However, the correlation and impact of the tax variables on FDI could be sensitive to varying set of explanatory variables. Hence the EBA approach is employed to test the relationship between OTRs, TPHM and FDI[17].

6 EBA Methodology and robustness results

Robustness and sensitivity tests are performed using Leamer's (1983) Extreme-Bound Analysis (EBA) technique (and as explained by Gujarati, 2003), on both the TPHM and OTR data for 2010[18], based on the economic expectations (for the pool of tax variables) stipulated in Table D.1 of Appendix D.

6.1 Methodology - Model specification and estimation technique

In applying the EBA technique to a linear cross-sectional regression explaining FDI the model takes the form:

$$Y_i = \alpha_i + \sum_{j=1}^{n} \delta_i X_{ji} + \beta M_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \qquad \text{(E1.3)}$$

Where Y_i is inward foreign direct investment flows into country i, X_{ji} is the jth explanatory variable of country i that is included in every regression (usually an important explanatory variable, for example export), M_i is the variable of

[17] For comparability, due to the fact that tax rates usually stay the same for a number of years before being changed and due to data constraint, the TPHM and OTR results are presented and analysed for 2010 only. The results further enable a robustness test using the EBA technique.

[18] The choice of variables is structured along Levine and Renelt (1992) and Sudsawasd and Mongsawad (2011) amongst others.

interest for country i whose robustness is under investigation (for example, a tax variable or key regressor always included in the model), Z_{ji} is the jth potentially important explanatory variable[19] (also termed doubtful variables or of secondary importance) in country i and ε_i is the error term in country.

Based on equation 1.3 above, an EBA[20] equation for the first set of variables of interest (tax policy harmonisation - TPH) and the second set of variables of interest (optimum tax rates - OTRs) are consecutively specified as:

TPH specification:

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta CHAR_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.4}$$

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta VHAR_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.5}$$

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta TREV_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.6}$$

OTRs specification:

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta t1_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.7}$$

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta t2_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.8}$$

$$FDI_i = \alpha_i + \delta_i EXPO_i + \beta TREV_i + \sum_{j=1}^{k} \gamma_i Z_{ji} + \varepsilon_i \tag{E1.9}$$

Where i represent the cross-sections, FDI_i is inward foreign direct investment flows into country i, $EXPO_i$ is the export variable for country i, $CHAR_i$ and $VHAR_i$ are the CIT and VAT harmonisation variables respectively for country i, $TREV_i$ is the tax revenue collected variable for country i, $t1_i$ and $t2_i$

[19] The Z variables include the share of government expenditures in GDP, inflation rate, the growth of the domestic credit, gross domestic product, real interest rates and institutional quality protection of investors.

[20] The EBA method is used to first model a base regression (estimation without the Z variables), but including all X and M variables. The Z-variables are chosen from a predetermined pool of variables. The robustness of high extreme bound is determined from highest estimated coefficient (β) of the variable of interest (M) plus any combination of the optional or Z variables; while the robustness of low extreme bound is determined from lowest estimated coefficient (β) of the variable of interest (M) plus any combination of the optional or Z variables. The EBA approach therefore allows for subsequent estimations and modeling, based on the result of the base regression, approximated by varying the combination of Z variables to be included in the process, (based on a particular significance level) (Sudsawasd and Mongsawad, 2011).

are the CIT and VAT optimum tax rates respectively for country i, Z_{ji} is the set of optional explanatory variables in country i (such as government expenditure, growth rate of domestic credit, real interest rates, inflation) and ε_i is the error term in country.

The EBA model is estimated on cross-sectional data based on equations 1.4 to 1.9 above (investigating the robustness of five tax variables - CHAR, VHAR, TREV, t1, t2), yielding varying results on the impact of TPHM and OTRs on FDI for 2010. The basis for inference of the EBA result is that, the extreme values of the variable of interest (coefficients of all estimates) have to remain statistically significant and of the same economic specification before the model estimation process. Also, all coefficient results have to be within a very narrow band or range, for the inference to be made that the result (hence the tax variable of interest) is "robust." Otherwise, the variable is described as being "fragile" (Gujarati, 2003; Sudsawasd and Mongsawad, 2011). See the robustness results in Tables D.1 and D.2 of Appendix D.

6.2 EBA results of robustness check - TPHM and OTR

Table D.1 (of Appendix D) shows the estimated coefficients results of both CHAR and VHAR (the tax harmonisation variables of interest) to be statistically insignificant and fragile. Surprisingly this indicates that changes in the CIT (TPHM) and VAT (TPHM) rates do not relate to the level of FDI in the SADC. However, the findings are consistent with Sudsawasd and Mongsawad (2011:689), who found a fragile correlation of corporate taxes and consumption taxes with FDI in the developed and developing countries. The tax revenue indicator (TREV) is shown to have a significant negative but robust correlation with FDI at the 10% level, in line with Sudsawasd and Mongsawad (2011). The result indicates that more variations in tax policy aimed at improving individual SADC country tax revenue positions, may impact negatively on FDI to the region. This denotes the importance of regional co-operation in tax policy in order to attract FDI, as large differences may crowd out FDI.

Alternatively Table D.2 (of Appendix D) shows the estimated results of both the optimum CIT rate (t1) and VAT rate (t2) indicators (tax variables of interest) to be positive, statistically significant and robustly correlated with FDI at the 10% level. The results highlight the benefit of adopting optimum tax rates which are more robust than TPHM towards improving FDI in 2010. The robust finding of optimum taxes and FDI aligns with Sudsawasd and Mongsawad (2011), who generally found CIT and consumption taxes to be robustly correlated with FDI. The tax revenue indicator (TREV) is also shown to have a significant negative but robust correlation with FDI at the 10% level equally highlighting the need to maintain less variation in tax rates and tax policy in order to improve on FDI flows. The finding is consistent with Sudsawasd and Mongsawad (2011).

7 Conclusion, policy implications and future research

This paper provided an understanding of the dynamics of tax harmonisation in the SADC vis-à-vis other regional groupings and presented a basis for policy intervention to attract FDI and promote growth. The analysis is in line with the 2002 SADC Memorandum on taxation (SADC, 2002). The conclusion arrived at is that tax harmonisation in the SADC is feasible, generally in line with the observations made by Letete (2012).

The contribution of this paper is in measuring tax policy harmonisation (TPH) and innovatively computing an optimum tax rate for the SADC. The process introduced new panel and cross-sectional tax data for the region. Subsequently, the data obtained from the TPHM and the OTR was used to ascertain robust measures of tax rates on FDI in the SADC through an extreme bound analysis (EBA) technique for the first time. The empirical results highlighted the fragile and robust role of TPHM and OTR, respectively, in influencing FDI flows to the SADC in 2010. Importantly, the sensitivity analysis (by means of the EBA results) provided impetus to subsequent empirical investigations.

The analysis shows some important policy implications for the SADC (given its heterogeneous nature), aimed at enhancing the process of regional tax harmonisation. First, there is a need for the SADC to develop policies aimed at collectively expanding corporate tax base in order to accommodate the relatively low optimum CIT rates, particularly because the adoption of lower optimum CIT rates may lead to a reduction in tax revenue. Second, the adoption of an optimum VAT rate by all SADC member countries will reduce the usage of different politically motivated VAT rates by individual member states as instruments to gain voters' confidence. Third, the overlapping membership of regional groupings of the SADC countries could stifle further tax harmonisation initiatives in the SADC, warranting relevant policy intervention. Fourth, given that there is already a protocol on taxation in the SADC, some further policy considerations towards enhanced harmonisation and tax revenue could include developing a benchmarking process with other regional economic groupings. These include economic groupings in pursuit of tax harmonisation such as the EU and the EAC.

Two study proposals emanate. First, it is necessary to assess the extent of tax policy harmonisation in the SADC using the median-based TPH measure which is less affected by outliers when compared to the mean-based TPH measure. Second, the cross-sectional OTRs data could be expanded to a panel data with the availability of more data, in order to empirically assess its impact on FDI flows to the SADC, thereby accounting for country specific dynamics.

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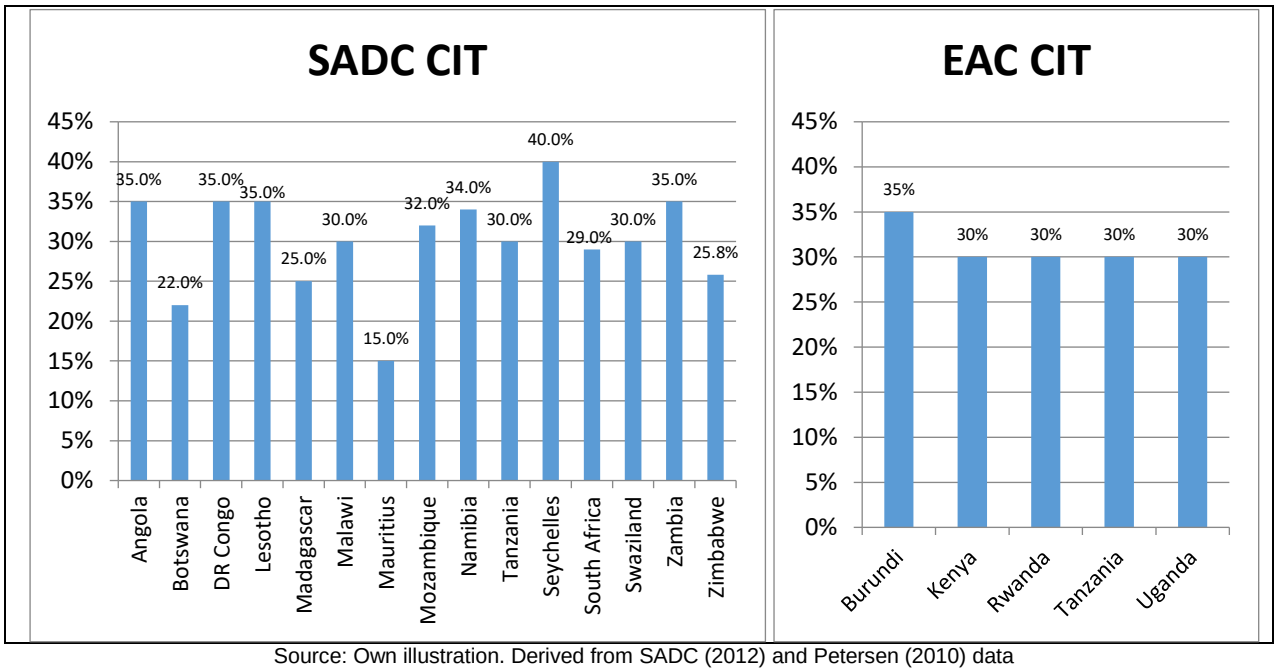
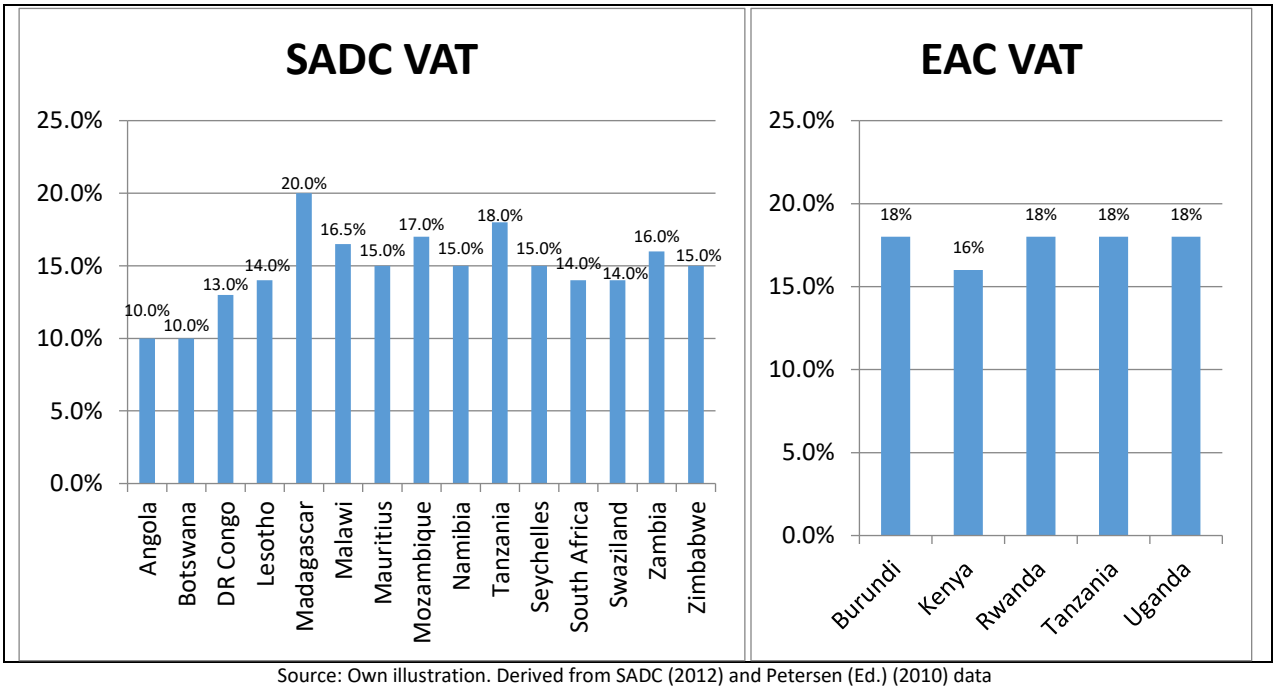
Figure 1: Regional comparison of statutory CIT rates for 2010



Source: Own illustration. Derived from SADC (2012) and Petersen (2010) data

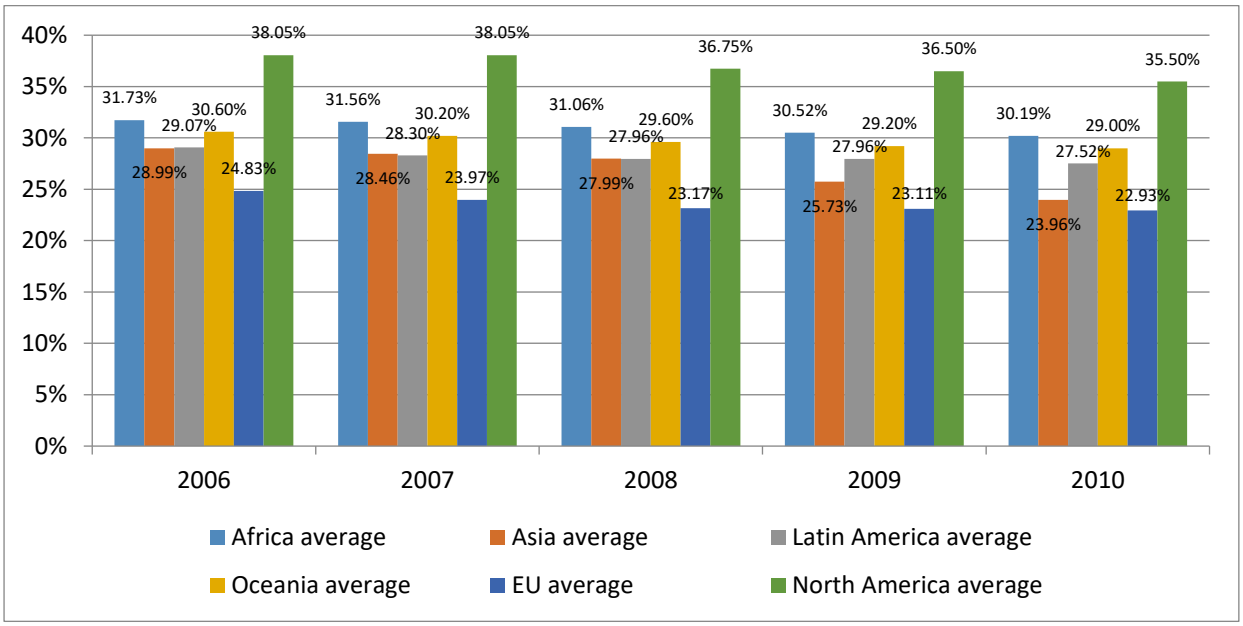
Figure 2: Regional comparison of standard VAT[1] rates for 2010



Source: Own illustration. Derived from SADC (2012) and Petersen (Ed.) (2010) data

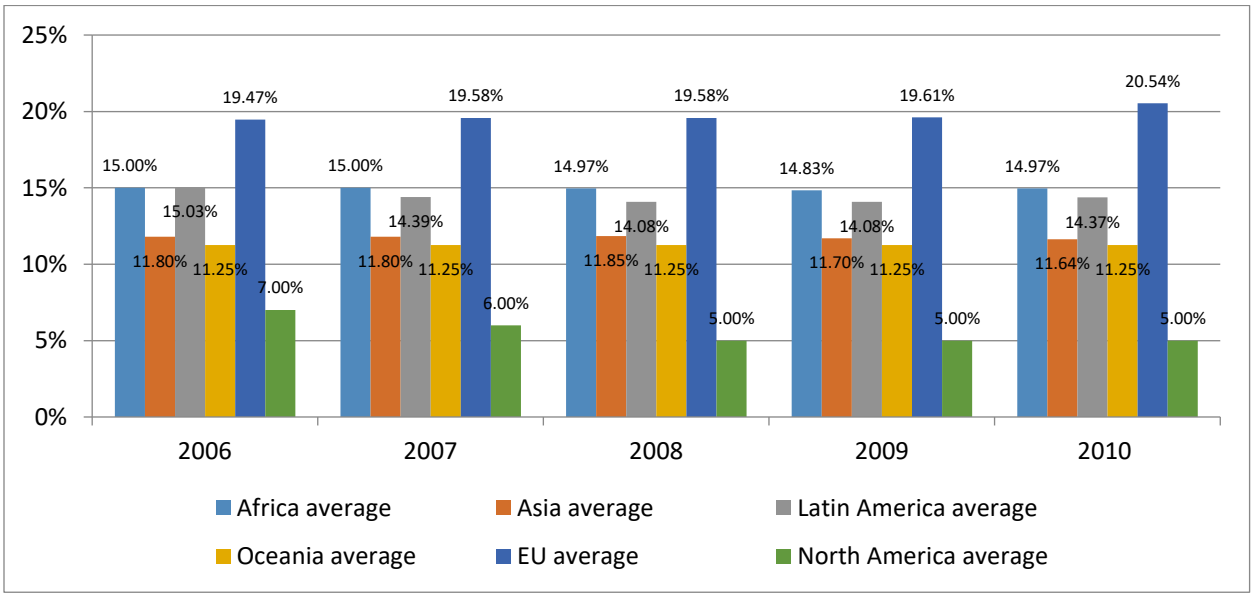
[1] A proxy for VAT (GST) is used in Angola.

Figure 3: Corporate tax rates for 2006-2010



Source: Own illustration. Derived from KPMG (2014) data

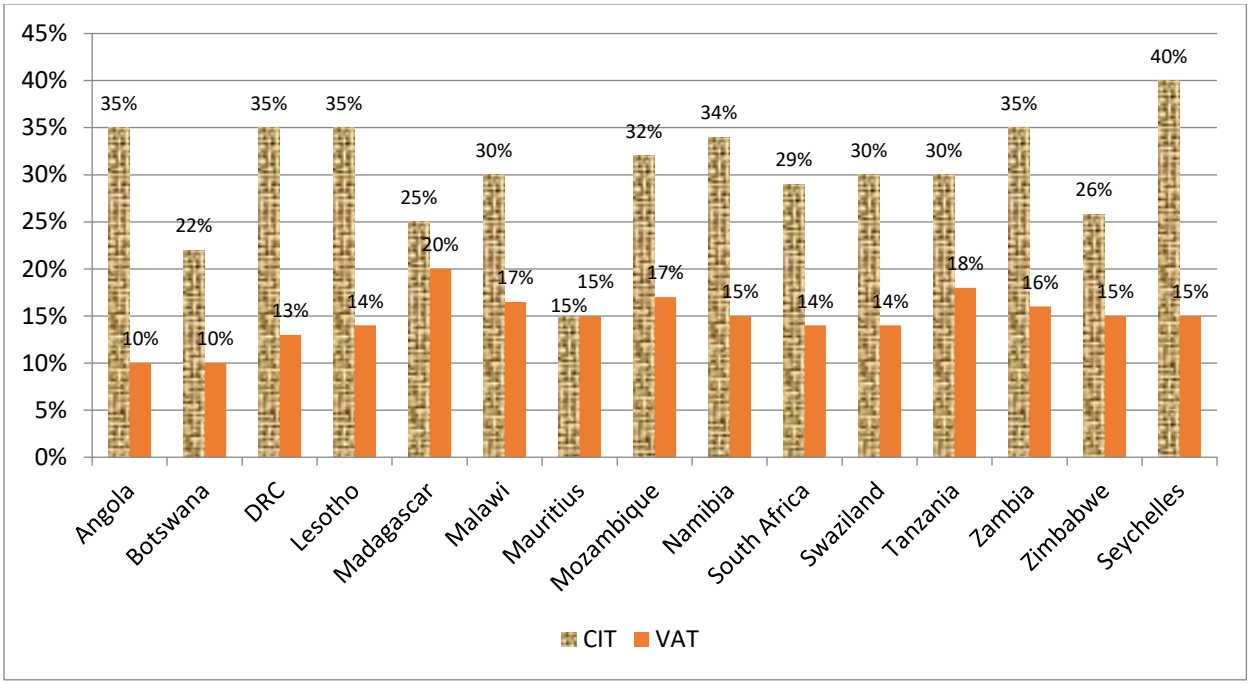
Figure 4: Value added tax rates for 2006-2010



Source: Own illustration. Derived from KPMG (2014) data

Appendix A

Figure A.1: Comparison of statutory CIT and standard VAT rates (or proxy) in SADC, 2010



Source: Own illustration. Derived from Deloitte and Touché (2013) and SADC (2011) data
Note: Angola has no VAT (proxy by GST)

Appendix B

Table B.1: Variable, source and definition

Applicable abbreviation	Variable	Sources	Definition
FDI	Foreign direct investment net inflows to the SADC	World Bank (2013)	FDI net inflows share of GDP. Measured as the net foreign inflow into the SADC (% of GDP)
CIT1	Corporate Income Tax (maximum statutory rate)	SADC 2011	Maximum statutory corporate tax rate, calculated on profit before tax
VAT1	Value Added Tax (standard rate). (Also a proxy for general sales tax, GST)	SADC 2011	Applicable standard VAT rate or GST on goods and services as percentage of value added of industry and services.
TREV	Tax revenue	SADC 2011, the IMF (2014).	Collected corporate tax on profits, income, and capital gains (CIT2) and also from VAT as a percentage of GDP (VAT2).
GOV	Government expenditure	World Bank (2013).	Share of government expenditure in GDP (GOV)
DCR	Domestic credit growth rate	World Bank (2013).	Growth rate of (net) domestic credit (constant prices)
EXPO	Export	World Bank (2013)	Total trade exports of the SADC countries to the developed world, share of GDP
INF	Inflation	World Bank (2013; IMF (2014).	Rate of inflation for the SADC countries
GDP	Gross Domestic Product (constant prices)	World Bank (2013)	Annual percentage growth rate of GDP (constant 2005 U.S. dollars).
RIR	Real Interest Rate	World Bank (2013); IMF (2014).	Percentage of real interest rate (lending interest rate) adjusted for inflation as measured by the GDP deflator.
INQP	Institutional Quality Protection of investors	World Bank (2012).	Strength of investor protection index (0-10)

Source: Compiled from various sources

Note: The CIT and VAT rates are used in both CIT and VAT harmonisation measures (CHAR and VHAR) and computation of optimum CIT and VAT rates (t1 and t2).

Table B.2: Variables and Proxies (OTR measures)

Variable and applicable abbreviation	Proxy	Sources	Definition of variables
Profits ($\bar{\pi}$).	Percentage of real annual sales growth (mainly manufacturing). Sales increases or decreases which illustrate revenue growth over time is used as proxy for profits or turnover of multinationals (Daunfeldt, Orth and Rudholm 2005; Gwatidzo, 2008).	World Bank (2015).	A cross-sectional company-level data of sales revenue based on surveys conducted by the World Bank Group.
Foreign Direct Investment (FDI)	N/A	UNCTAD (2011), SADC (2011)	FDI inflows in the SADC, Million US Dollars
Marginal cost	Cost of business start-up procedures (% of GNI per capita) Olive, (2002); Elhauge and Geradin, (2011).	World Bank (2012).	Cost to register a business by multinationals which is normalised by presenting it as a percentage of gross national income (GNI) per capita.
Price	GDP deflator.	World Bank (2013)	Constant prices of all new, domestically produced, final goods and services of multinationals

Source: Compiled from various sources

Appendix C

Table C.1: Percentages of VAT TPHM in the SADC, % (2000-2010)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Angola	9	9	9	9	9	9	9	9	9	9	9
Botswana	9	9	9	9	9	9	9	9	9	9	9
DRC	9	9	9	9	9	9	9	9	18	18	18
Lesotho	27	27	27	27	27	27	27	27	27	27	27
Madagascar	82	82	82	82	82	82	82	82	82	82	82
Malawi	50	50	50	50	50	50	50	50	50	50	50
Mauritius	36	36	36	36	36	36	36	36	36	36	36
Mozambique	55	55	55	55	55	55	55	55	55	55	55
Namibia	36	36	36	36	36	36	36	36	36	36	36
Seychelles	36	36	36	36	36	36	36	36	36	36	36
South Africa	27	27	27	27	27	27	27	27	27	27	27
Swaziland	27	27	27	27	27	27	27	27	27	27	27
Tanzania	82	82	82	82	82	82	82	82	82	64	64
Zambia	59	59	59	59	59	59	59	59	45	45	45
Zimbabwe	36	36	36	36	36	36	36	36	36	36	36

Source: Own calculations from data collected from SADC (2011); Deloitte and Touché (2013); KPMG (2014).
Note: ŕt = 11. ŕt represents the SADC group average of standard VAT rate. GST is proxy for VAT in Angola. 0% < TPHM ≤50%, high harmonisation of tax rates (figures are absolute values); 50% < TPHM ≤100%, low harmonisation of tax rates (figures are absolute values). Ranges are own classification adapted from Sudsawasd and Mongsawad (2011:667).

Table C.2: Percentages of CIT TPHM in the SADC, % (2000-2010)

Country	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Angola	21	21	21	21	21	21	21	21	21	21	21
Botswana	14	14	14	14	14	14	14	14	14	24	24
DRC	21	21	21	21	21	21	38	38	38	38	21
Lesotho	38	38	38	38	38	38	21	21	21	21	21
Madagascar	14	14	14	14	14	14	14	14	14	14	14
Malawi	3	3	3	3	3	3	3	3	3	3	3
Mauritius	14	14	14	14	14	14	14	22	48	48	48
Mozambique	10	10	10	10	10	10	10	10	10	10	10
Namibia	21	21	21	21	21	21	17	17	17	17	17
Seychelles	38	38	38	38	38	38	38	38	38	38	38
South Africa	3	3	3	3	3	3	0	0	0	0	0
Swaziland	3	3	3	3	3	3	3	3	3	3	3
Tanzania	21	21	21	21	21	21	3	3	3	3	3
Zambia	21	21	21	21	21	21	21	21	21	21	21
Zimbabwe	38	38	38	38	38	7	7	7	11	11	11

Source: Own calculations from data collected from SADC, 2011; Deloitte and Touché (2013); KPMG (2014)
Note: $\acute{r}t = 29$. $\acute{r}t$ represents the SADC group average statutory CIT rate. 0% < TPHM ≤50%, high harmonisation of tax rates and 50% < TPHM ≤100%, low harmonisation of tax rates (figures are absolute values). Ranges are own classification adapted from Sudsawasd and Mongsawad (2011).

Table C.3: Percentages of tax harmonisation levels in the SADC (2010)

Country	TPHM Standard VAT rates (ŕt=11)	Extent of harmonisation in VAT rates	TPHM Statutory CIT rates (ŕt=29)	Extent of harmonisation in CIT rates
Angola	9%	high	21%	high
Botswana	9%	high	24%	high
DRC	18%	high	21%	high
Lesotho	27%	high	21%	high
Madagascar	82%	low	14%	high
Malawi	50%	high	3%	high
Mauritius	36%	high	48%	high
Mozambique	55%	low	10%	high
Namibia	36%	high	17%	high
Seychelles	36%	high	38%	high
South Africa	27%	high	0%	high
Swaziland	27%	high	3%	high
Tanzania	64%	low	3%	high
Zambia	45%	high	21%	high
Zimbabwe	36%	high	11%	high

Source: Own calculations from data collected from SADC 2011; SADC 2012
Note: ŕt represents the SADC averages of both VAT and CIT; GST is proxy for VAT in Angola. 0% < TPHM ≤50%, high harmonisation of tax rates and 50% < TPHM ≤100%, low harmonisation of tax rates (figures are absolute values). Ranges are own classification adapted from Sudsawasd and Mongsawad (2011).

Table C.4: The SADC FDI inflows and tax rates (2010)

	FDI, net inflows (% of GDP)	Optimum tax rates *vis-a-vis* current tax rates (%)			
	FDI	CIT (Statutory rates)		VAT (Standard rates)	
Country		**Optimum CIT**	**Current CIT rates**	**Optimum VAT**	**Current VAT rates**
Angola	-3.9	35	35	17	10
Botswana	-0.4	20	22	21	12
DRC	20.8	31	35	31	14
Lesotho	5.2	23	35	24	13
Madagascar	9.7	28	25	25	20
Malawi	1.8	25	30	22	16.5
Mauritius	4.4	19	15	25	15
Mozambique	10.8	38	32	27	17
Namibia	6.2	33	34	26	15
Seychelles	16.0	41	40	27	15
South Africa	0.3	22	29	29	14
Swaziland	3.7	29	30	29	14
Tanzania	4.5	27	30	23	18
Zambia	10.7	34	35	27	16
Zimbabwe	2.2	38	28.8	28	15
Averages	**6.2**	**29.53**	**30.37**	**25.40**	**14.97**

Source: Own calculations from data collected from various sources
Note: GST is proxy for VAT in Angola

Appendix D

Table D.1: EBA *a priori* expectations - Dependent variable FDI

Variable of interest (M)	Expected signs	Deduction made
FDI		Dependent variable
CHAR	Negative/ Positive	More variation upward (more deviation) in a country's statutory CIT rate from that of the SADC group average would lead to a reduction in FDI (negative relationship). More harmonisation and synchronisation (less deviation) in a country's statutory CIT rate in accordance with the SADC group average would improve investors' confidence and FDI inflows (positive relationship).
VHAR	Negative/ Positive	More variation upward (more deviation) in a country's standard VAT rate from that of the SADC group average would lead to a reduction in FDI (negative relationship). More harmonisation and sychronisation (less deviation) in VAT rates by a member country in accordance with that of the SADC group average would improve investors' confidence and FDI (positive sign).
t1	Negative/ Positive	An increase in tax competition and divergence in tax rates as opposed to adopting optimum CIT rates in the SADC would reduce FDI inflows (negative relationship). The adoption of optimum CIT rates in the SADC would improve investors' confidence and FDI (positive sign).
t2	Negative/ Positive	An increase in tax competition and divergence in tax rates as opposed to adopting optimum VAT rates in the SADC would reduce FDI inflows (negative relationship). The adoption of optimum VAT rates in the SADC would improve investors' confidence and FDI (positive sign).
TREV	Negative/ Positive	More variation upward (more deviation) in a country's tax policy and revenue collection methods, from that of other SADC countries would lead to a reduction in FDI (negative relationship). More harmonisation (less variation) in tax policy and improved co-ordination of tax revenue collection strategy (including the tax bases) in line with the regional protocols, creates less ambiguity, boost investors' confidence, leading to better tax revenue collection and higher FDI (positive sign).

Source: Motivated by Mesa and Parra-Pena (2008); Sudsawasd and Mongsawad (2011)

Table D.2: EBA sensitivity results, TPHM (Dependent variable: FDI) for SADC, 2010

Variables of interest (M) TPHM	Description	Coefficient (β)	t-stats	Standard error	Z-variables/ Optional variables	Robust/Fragile	Predicted Sign
CHAR	High	-0.032557	-0.234255	0.138983	EXPO,DCR,GDP	Fragile	Negative/ Positive
	Base	-0.034111	-0.265782	0.128342			
	Low	-0.054743	-0.324784	0.168554	DCR,EXPO,INQP,INF		
VHAR	High	0.182063 *	1.949244	0.093402	EXPO,RIR,GDP,INF	Fragile	Negative/ Positive
	Base	0.145572	1.643359	0.088582			
	Low	0.164072 *	1.871182	0.087684	EXPO,RIR		
TREV	High	-0.438474 *	-1.913366	0.229164	EXPO,INQP	Robust	Negative/ Positive
	Base	-0.443633 *	-2.069997	0.214316			
	Low	-0.473348 *	-2.020570	0.234265	EXPO,GDP		

Source: Derived using eviews 8

Table D.3: EBA sensitivity results, OTR (Dependent variable: FDI) for SADC, 2010

Variables of interest (M) OTR	Description	Coefficient (β)	t-stats	Standard error	Z-variables/ Optional variables	Robust/Fragile	Predicted Sign
t1	High	44.81106 *	2.118780	21.14946	EXPO,RIR,GOV	Robust	Negative/ Positive
	Base	39.92150 *	1.836907	21.73300			
	Low	39.09480 *	1.752847	22.30359	EXPO,INF		
t2	High	87.45988 *	2.060919	42.43732	EXPO,GOV,INF	Robust	Negative/ Positive
	Base	81.43566 *	2.017677	40.36110			
	Low	78.68135 *	1.944268	40.46837	EXPO,GOV,		
TREV	High	-0.432678 *	-1.993816	0.217010	EXPO,RIR	Robust	Negative/ Positive
	Base	-0.443633 *	-2.069997	0.214316			
	Low	-0.473348 *	-2.020570	0.234265	EXPO,GDP		

Note: ***, **, * in Tables D.2 and D.3 denote 1%, 5%, 10% significant levels respectively. All estimated results are based on a pool cross-sectional model estimator for 15 observations. The small sample size of the model closely captures the variability in tax rates in the SADC. The variables used in the EBA are FDI, VHAR, CHAR, TREV, EXPO, INF, DCR, GOV, GDP, INQP (Table D.2 using TPHM) and FDI, t1, t2, TREV, EXPO, INF, DCR, GOV, GDP, INQP (Table D.3 using Optimum taxes). Positive and significant coefficients results highlight the benefits of using regional tax rates in improving FDI; while negative and significant coefficients highlight the need to maintain less variation in tax rates and tax policy in order to improve on FDI.